Worksheet 3 Relational databases and normalisation

1. Write definitions for

   First Normal Form (1NF)

   Second Normal Form (2NF)

   Third Normal Form (3NF)

2. A car dealer has several different branches which each sell cars, and a database is being designed to hold data about the cars they sell and the salespeople who sell them.

   - Each branch is identified by town. There is a maximum of one branch in each town
   - Each make of car is identified by a unique model name
   - Each model of car is made by only one manufacturer
   - Each salesperson is identified by their SalesID. The number of each model of car that they sell (SalesVol) is recorded

   A first attempt at designing a table to hold the data has been made. The table, called CarSales, is shown below with some sample data.

   (a)

SalesID	Name	Branch	Model	SalesVol	Manufacturer
S123	Gerry	Norwich	Clio C3 Picasso Civic	3 4 5	Renault Citroen Honda
S555	Shirley	Cromer	Juke C4 Octavia	1 2 4	Nissan Citroen Skoda
S442	Dave	Cromer	C3 Picasso Octavia	5 1	Citroen Skoda

   Why is this table not in First Normal Form (1NF)?

(b) The data is split into two tables. Show the contents of the two tables

Table: SalesPerson

SalesID	Name	Branch

Table: ProductSales

SalesID	Model	SalesVol	Manufacturer

(c) A relationship between the tables has been implemented. Explain how this has been done.

(d) Explain why the ProductSales table is not in Third Normal Form (3NF)

(e) Draw an entity relationship diagram to show the entitities in the database in 3NF.

(f) Write the table definitions for the database in 3NF. Use the notation *Tablename* (*keyfield*, *Attribute1*, *Attribute2*, ...)

(g) Identify the foreign key(s) in one of the tables.